

**Proyecto/Guía docente de la asignatura**

Se debe indicar de forma fiel cómo va a ser desarrollada la docencia. Esta guía debe ser elaborada teniendo en cuenta a todos los profesores de la asignatura. Conocidos los espacios y profesorado disponible, se debe buscar la máxima presencialidad posible del estudiante siempre respetando las capacidades de los espacios asignados por el centro y justificando cualquier adaptación que se realice respecto a la memoria de verificación. Si la docencia de alguna asignatura fuese en parte online, deben respetarse los horarios tanto de clase como de tutorías). La planificación académica podrá sufrir modificaciones de acuerdo con la actualización de las condiciones sanitarias.

Asignatura	CREATIVITY AND INNOVATION IN INDUSTRIAL DESIGN		
Materia	INDUSTRIAL ENGINEERING INTERNATIONAL SEMESTER		
Módulo			
Titulación	Transversal course for the seven bachelor's degrees taught in industrial engineering.		
Plan	Since 2016	Código	75000
Periodo de impartición	2º semester	Tipo/Carácter	Obligatorio
Nivel/Ciclo	Degree	Curso	Transversal course
Créditos ECTS	6		
Lengua en que se imparte	English		
Profesor/es responsable/s	Nieves Fernández Villalobos [coordinadora] Sagrario Fernández Raga Sara Pérez Barreiro Iván I. Rincón Borrego Carlos Rodríguez Fernández		
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Horario de tutorías	They will be specified on the website		
Departamento	Theory of Architecture and Architectural Projects.		



1. Situación / Sentido de la Asignatura / / Sense of the Course

1.1 Contextualización/ Contextualization

The subject is part of the International Semester. It is one of the three subjects that students can choose to study in addition to the final project.

1.2 Relación con otras materias/ Relationship with other subjects

The elective subjects that the student can choose in the international semester are:

Environment and Renewable Energy

Science, Technology and Society

Creativity and Innovation in Industrial Design

System Dynamics. Modelling and Simulation in Engineering

Technical Projects Development and Manufacturing Engineering

Spanish Course.- Language Centre

1.3 Prerrequisitos/ prerequisites

Although it is not obligatory, it is advisable that the student knows how to use some computer drawing tools of design.



2. Competencias/ / Competences

2.1 Generales/ General Competences

- Capacity for abstraction, analysis and synthesis.
- Ability to organize and planning time.
- Critical reasoning ability / logical analysis.
- Ability to apply knowledge to practice.
- Capacity to work in a team effectively.
- Capacity for creativity and innovation.

2.2 Específicas/ Specific Competences

- Project Culture: ability to adapt creativity, methodological tools and acquired knowledge to solve problems of different nature, related to the development of the product.
- Ability to communicate in formal graphic and symbolic languages
- Transversality of knowledge
- Implementation of industrial design and development projects
- Ability to plan the development phases of a product at the conceptual level.
- Capacidad para determinar los requerimientos formales y funcionales de un producto.
- Ability to project, visualize and communicate ideas.

3. Objetivos/ Objectives

- Students will know the current trends in industrial design and the challenges of the discipline and will use them as a starting point for creation and innovation.(1)
- Students will analyze different products and will extract from them their innovation strategies. (1)
- Students will know and apply creative techniques in the development of design projects. (2)
- Students will create drawings prior to final design ideation, and discuss critically about the process, choice of alternatives and decision making in the final result.(2 Y 3)
- Students will know and apply the methods and techniques for the semiotic analysis.(3)
- Students will develop skills for creating visual messages. (3 y 4)
- Students will understand, apply and implement the basic principles of visual, graphic and compositional language. (4)
- Students will apply the main concepts of Graphic Design in different projects. (4)



4. Contenidos y/o bloques temáticos Bloques temáticos_ LEARNING UNITS

Bloque 1: Innovation in industrial design. Evolution of the discipline, current trends and challenges for innovation.

Carga de trabajo en créditos ECTS: 16 presential hours

a. Contextualización y justificación

Introduction in industrial design. Innovation. Key examples

b. Objetivos de aprendizaje

- Students will know the current trends in industrial design and the challenges of the discipline and will use them as a starting point for creation and innovation.
- Students will analyze different products and will extract from them their innovation strategies.

c. Contenidos

- Innovation in industrial design. Basic concepts and tools for innovation.
- Icons of innovation in the discipline.
- Design social utopia or reality? Trends and design challenges: emotional design, critical design, inclusive design, design for extreme situations, health design, green design, etc.

d. Métodos docentes

Expository method, project-based learning, cooperative learning.
Exhibition of contents and analysis exercises with the students about specific examples.

e. Plan de trabajo

It will be developed in the first 8 weeks.

f. Evaluación

Participation in class, exercises and project.

g. Bibliografía básica

- AICHER, Otl: *El mundo como proyecto*. Barcelona: Gustavo Gili, 1997.
BONSIEPE, Gui, *El diseño de la periferia*. Debates y experiencias. Barcelona: Gustavo Gili, 1985.
BRAUNGART, Michael; McDONOUGH, William: *Cradle to Cradle. De la cuna a la cuna. Rediseñando la forma en que hacemos las cosas*. Madrid: McGraw Hill, 2005 (1ª ed. 2003).
PAPANEK, Victor: *Diseñar para el mundo real: ecología humana y cambio social*. Madrid: Blume, 1977.
WOODHAM, Jonathan M.: "Design and Social Responsibility". *Twentieth Century Design*. Londres, Oxford: Oxford University Press, 1997. Págs. 221- 239.

h. Bibliografía complementaria

- A.A.V.V. (ANTONELLI, Paola (ed.)): *Safe. Design Takes on Risk*. Nueva York: The Museum of Modern Art, 2005.
A.A.V.V. (HURTADO, Rosario y FEO, Roberto): *Diseños para Todos*. Madrid: Optima!, 2008



- A.A.V.V. (SMITH, Cynthia E.), *Design for the other 90%*. Nueva York: Smithsonian, Cooper-Hewitt, National Design Museum, 2007.
- BARBEZO, Silvia; COZZO, Brunella: *Ecodesign*. Ullmann. Köningswinter, 2009.
- BROWER, Cara; MALLORY, Rachel; OHLMAN, Zachary: *Diseño eco-experimental*. Barcelona: Gustavo Gili, 2007. (1ª ed. Experimental Eco-Design. Rotovision, 2005.)
- FIELL, Charlotte & Peter (eds.): *Designing the 21st Century*. Colonia: Taschen, 2003.
- HERWIG, Oliver: *Universal Design. Solutions for a barrier-free living*. Basel: Birkhäuser, 2008.
- NORMAN, D.A.: *La psicología de los objetos cotidianos*. Ed. Nerea, Madrid, 1990.
- NORMAN, Donald A.: *Por qué nos gustan o no los objetos cotidianos*. Barcelona: Paidós, 2005.
- NORMAN, Donald A. *El diseño de los objetos del futuro. La interacción entre el hombre y la máquina*. Paidós, Barcelona, 2010.
- PIBERNAT, Oriol (comis.) *La utilidad del diseño*. Madrid: Círculo de Bellas Artes, 2008.
- PUYUELO CAZORLA, Marina; MERINO SANJUAN, M^a Dolores (comis.): *Reptes de Disseny/Retos del Diseño/ Design Challenges*. Valencia: Universitat Politècnica de València, 2009.
- UPHAUS, Nicolas (ed.): *Ecological Design*. Italia: teNeues, 2008.
- VIÑOLAS MARLET, Joaquim: *Diseño Ecológico. Hacia un diseño y una producción en armonía con la naturaleza*. Barcelona: Blume, 2005.

i. Necessary resources

Laptop, projector, drawing tools, etc

Bloque 2: The creative process. Creativity techniques.

Carga de trabajo en créditos ECTS: 16 presential hours

a. Contextualización y justificación

Creativity: process, techniques. Practices

b. Objetivos de aprendizaje

- Students will know and apply creative techniques in the development of design projects.
- Students will create drawings prior to final design ideation, and discuss critically about the process, choice of alternatives and decision making in the final result.

c. Contenidos

- Introduction to industrial design. The design process. Phases.
- Creativity. The process of creativity.
- Creativity techniques: association of ideas, brainstorming, sleepwriting, automatic writing, esperpento, forced relationships, Syntectics, etc.

d. Métodos docentes

Expository method, project-based learning, cooperative learning.
Theoretical and practical classes, application to project.



e. Plan de trabajo

It will be developed in the first 8 weeks.

f. Evaluación

Continuous evaluation of the development of the project, with partial and final deliveries, and public presentation of the work.

g. Bibliografía básica

GÓMEZ-SENENT, E. *Las fases del proyecto y su metodología*. Valencia: ETSII, 1992.

MUNARI, Bruno. *Cómo nacen los objetos. Apuntes para una metodología proyectual*. Barcelona: Gustavo Gili, 1983.

RICARD, André. *La aventura creativa*. Barcelona: Ariel, 2000.

h. Bibliografía complementaria

ACHA, Juan: *Introducción a la creatividad artística*. Méjico: Trillas, 2008.

ALONSO MONREAL, Carlos: *Qué es la creatividad*. Madrid: Biblioteca Nueva, D.L., 2000.

BASSAT, Luis: *La Creatividad*. Barcelona: Conecta, 2014.

GÓMEZ-SENENT, E. *Las fases del proyecto y su metodología*. Valencia: ETSII, 1992.

RICARTE BESCÓS, José María: *Procesos y técnicas publicitarias: ideas básicas*. Bellaterra: Universitat Autònoma de Barcelona, 2000.

VALDERRAMA, Beatriz: *Creatividad Inteligente: guía para convertir ideas en innovación*. Madrid: Pearson, 2012.

i. Recursos necesarios

Laptop, projector, drawing tools, etc

Bloque 3: Design Thinking. Process and development.

Carga de trabajo en créditos ECTS: 14 presential hours

a. Contextualización y justificación

Explanation of the Design Thinking methodology. Practical application.

b. Objetivos de aprendizaje

- Students will create drawings prior to final design ideation, and discuss critically about the process, choice of alternatives and decision making in the final result.
- Students will know and apply the methods and techniques for the semiotic analysis.
- Students will develop skills for creating visual messages.

c. Contenidos

- Introduction to visual thinking and process: See, watch, imagine, show.
- Problem solving. Group Graphics and procedures.
- Storyboarding and Idea Mapping. Visual Planning and Digital Capture.



d. Métodos docentes

expository method, learning based on practical exercises.

e. Plan de trabajo

It will be developed in the last 7 weeks

f. Evaluación

participation and class attendance, practical exercises

g. Bibliografía básica

ARNHEIM, Rudolph. *El pensamiento visual*. Buenos Aires: Eudeba, 1971.

BUZAN, Tony: *Cómo crear mapas mentales*. Barcelona: Urano, 2013.

CROSS, Nigel: *Design Thinking*. Gran Bretaña: Bloomsbury, 2011.

ROAM, Dan: *Tu mundo en una servilleta*. Barcelona: Gestión 2000, 2010.

SIBBET, David: *Visual Meetings: How Graphics, Sticky Notes and Idea Mapping Can Transform Group Productivity*. Hoboken, NJ: Wiley, 2010.

h. Bibliografía complementaria

AUMONT, J.: *La imagen*. Barcelona: Paidós, 1992.

BARTHES, R.: *La aventura semiológica*. Barcelona: Paidós, 1993.

ROAM, Dan: *La Clave es la servilleta: Resolver problemas y vender ideas mediante dibujos*. Barcelona: Gestión 2000, 2013.

VOGEL, Craig; CAGAN, Jonathan; BOATWRIGHT, Peter: *The design of things to come: How ordinary people create extraordinary products*. New Jersey: Wharton school publishing, Pearson education, 2005.

i. Recursos necesarios

Laptop, projector, drawing tools, etc

Bloque 4: Graphic creation processes. Visual communication.

Carga de trabajo en créditos ECTS: 14 presential hours

a. Contextualización y justificación

Explanation of the creative process of Visual Communication. Practical application.

b. Objetivos de aprendizaje

- Students will develop skills for creating visual messages.
- Students will understand, apply and implement the basic principles of visual, graphic and compositional language.
- Students will apply the main concepts of Graphic Design in different projects.

c. Contenidos



- Visual Representation and graphic design concepts.
- Methodology graphic project: planning, visual communication strategies and phases of a graphic project.
- Corporate Visual Identity: identity, identification levels and methodology.

d. Métodos docentes

Expository method, learning based on practical exercises

e. Plan de trabajo

It will be developed in the last 7 weeks

f. Evaluación

participation and class attendance, practical exercises

g. Bibliografía básica

ARNHEIM, Rudolph. Arte y percepción visual: psicología del ojo creador, Alianza, 1979.

CHAVES, N: La imagen corporativa: Teoría y metodología de la identificación institucional. Gustavo Gili, Barcelona (3ª Ed., 1994).

DONDIS, D.A.: La sintaxis de la imagen. Introducción al alfabeto visual. Gustavo Gili, Barcelona, 1997.

SWANN, A: Bases del Diseño Gráfico. Gustavo Gili, Barcelona, 1990.

h. Bibliografía complementaria

ADAMS, S. y MORIOKA, N: Logo Design Workbook: A Hands-On Guide to Creating Logos. Rockport Publishers, Inc. 2004.

ARNHEIM, Rudolph. El pensamiento visual. Buenos Aires: Eudeba, 1971.

BARTHES, R.: La aventura semiológica. Barcelona, Paidós, 1993.

FLOCH, J.M.: Semiótica, marketing y comunicación; bajo los signos, las estrategias. Paidós Comunicación, Barcelona, 1993.

KANIZSA, G.: Gramática de la visión percepción y pensamiento. Barcelona, Paidós, 1998.

MUNARI, B: Diseño y Comunicación Visual, contribución a una metodología didáctica. Gustavo Gili, Barcelona, 1996.

LEBORG, C: Visual Grammar. Princeton Architectural Press, New York, 2006.

LUPTON, E: Graphic Design Thinking. Princeton Architectural Press, Maryland Institute College of Art, New York, 2008.

LUPTON, E. y PHILLIPS J.C: Graphic Design The New Basics. Princeton Architectural Press, New York, 2008.

SEBEEK, T.A: Signo, una introducción a la semiótica. Paidós Comunicación, Barcelona, 1996.

POULLIN, R: The Language of Graphic Design: An Illustrated Handbook for Understanding Fundamental Design Principles. Rockport Publishers, 2011.

WHEELER, A: Designing Brand Identity. An essential guide for the entire branding team. John Wiley & Sons, Inc., Hoboken, New Jersey, 2009 (3th edition)

ZELANSKY, P. y FISCHER, M.P. Color. Blume, Madrid, 2001.

i. Recursos necesarios

Laptop, projector, drawing tools, etc



5. Métodos docentes y principios metodológicos

The course consists of 4 modules or learning units; each one is divided into theoretic lessons, workshop/ practices, public corrections or checking and concerted tutoring classes.

The lectures will use primarily expository method for transmitting the fundamental knowledge of the subject. Active student participation will be encouraged.

In the tutoring classes a personal relationship between teacher and students will be established. They are usually developed in groups, previously arranged, in order to check the proper development of the work, prior to final delivery.

The practical classes/workshop will support for understanding and deepening of the concepts provided in lectures. The exercises will be done individually or in small groups, depending on the activity to develop and the number of students enrolled. Some of the works will be done in the classroom and others in non-attendance hours. All the works of each learning unit will be presented to the teacher and other students and handed to the teacher on the dates indicated in the schedule presented below.

6. Tabla de dedicación del estudiante a la asignatura/ Dedication of the student to the subject

Presential activities	hours	Non presential activities	hours
Learning Unit 1: theoretical, exercises and project	16	Learning Unit 1: exercises and project	24
Learning Unit 2: theoretical, exercises and project	16	Learning Unit 2: exercises and project	24
Learning Unit 3 : theoretical and exercises	14	Learning Unit 3 : exercises	21
Learning Unit 4: theoretical, exercises and project	14	Learning Unit 4: exercises and project	21
Total presencial	60	Total no presencial	90

7. Sistema y características de la evaluación/ System and characteristics of the evaluation

- The evaluation of students in **ordinary call** will be held according to the following parameters:
 - Attendance, Participation, Activities and Works made in Learning Unit 1: 25%
 - Attendance, Participation, Activities and Works made in Unit 2: 25%
 - Attendance, Participation, Activities and Works made in Unit 3: 25%
 - Attendance, Participation, Activities and Works made in Unit 4: 25%

To pass the course is essential to approve each of the parts separately.

- The evaluation of students in **extraordinary call** will be held according to the following parameters:
 - Activities and Works made in Learning Unit 1: 25%
 - Activities and Works made in Learning Unit 2: 25%
 - Activities and Works made in Learning Unit 3: 25%
 - Activities and Works made in Learning Unit 4: 25%

To pass the course is essential to approve each of the parts separately.